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OF

REDUCIBLE HERNIA.

BY

GEORGE HAYWARD, M.D.,

OF BOSTON, MASS.

PRESENTED TO THE AMERICAN MEDICAL ASSOCIATION,

AT ITS SESSION OF MAY, 1852.

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THE undersigned, a Committee of the American Medical Association on the Permanent Cure of Reducible Hernia, beg leave respectfully to report :—

That they addressed a number of questions to their professional brethren throughout the country, in the hope that they might in this way gain such information on the subject of their commission as they would not be likely to obtain in any other. They regret, however, to be compelled to state that they have received but seven answers, and that, though some of these are interesting and valuable, they still do not throw so much light upon the point to be investigated as they had hoped to derive from this source.

The first of them, from Royal A. Merriam, M. D., of Topsfield, Mass., is occupied by the details of an operation for femoral hernia in which a portion of the omentum was removed. The patient recovered, and lived twenty years without any further protrusion. It is not stated whether a truss was afterwards worn or not.

It seems to have been a common case of operation for strangulated femoral hernia, in which the omentum alone protruded. This operation, it is well known, sometimes effects, though very rarely, a permanent cure. It is also well known that the hernia much more frequently returns after it, unless other means are adopted to prevent it.

The second answer is from Geo. W. Hinman, M. D., Derby. It gives the history of a case of reducible inguinal hernia, in which the sac was laid open, and the inside of it "brushed over with the tincture of iodine," the contents of the sac having been, of course, previously returned into the abdomen. The patient did well, and there had been no return of the hernia at the time the letter was written—a year only after the operation—a period not sufficiently long to

enable any one to say that the cure would be permanent. It is not stated, either, whether the patient continued to wear a truss.

The writer of the third answer, Geo. O. Pond, M. D., of Griggsville, is confident that he has effected a cure, by means of pressure, in a number of cases of inguinal hernia. Stagnér's truss is the instrument by which the pressure has been applied; and of twenty cases he thinks that seven-eighths have been permanently cured. That pressure is one of the most important modes of treating hernia, with a view to a radical cure, there is no doubt; and upon this point the Committee will take occasion to speak hereafter. Though there is nothing new in this communication, it is nevertheless valuable, as it affords additional evidence of the power of one of the means employed to remove this infirmity.

The writer of the fourth letter, Geo. Heaton, M. D., of Boston, has devoted himself pretty extensively to the treatment of reducible hernia, and had given notice to that effect from time to time, for some years, in medical and other publications. It came to the knowledge of your Committee that two or three individuals regarded themselves as cured by his treatment, and, as he was a member of the profession of regular standing, it was supposed that he would cheerfully state his peculiar method, if any such he had, of managing such cases. The Committee, therefore, sent him not only a copy of the questions which they had addressed to the profession at large, but they also wrote him a private note, couched in the most respectful terms.

To this he made a courteous reply, but at the same time declined giving the information sought for. Not content with this, he caused the note addressed to him, and his answer, to be printed in several newspapers; which has, in our opinion, given him a notoriety, wherever the transaction is known, of a very unenviable character. It is certainly an unusual course for a member of our profession to conceal from his brethren any method of treatment which he may regard as more valuable than those in common use, and it is clearly one which cannot be too strongly reprobated by all honourable and high-minded men.

The fifth communication, from John Watson, M. D., of New York, was an account of an operation for the radical cure of an inguinal hernia by injection. The writer adopted the subcutaneous method, as recommended by Dr. Pancoast.

The result was favourable, but a sufficient length of time had not elapsed to enable any one to say that the beneficial effects will be

permanent. The operation was done about ten weeks before the letter was written.

A part only of the sixth answer, from Prof. Alden March, of Albany, was strictly in reply to the questions proposed by the Committee. Much the larger portion was occupied by a history of eleven cases of strangulated hernia, for the relief of which an operation was performed, and in eight of these the writer believes that a radical cure of the hernia was the consequence.

The remaining portion contains an account of four cases of reducible hernia, in each of which the writer performed the subcutaneous operation by injection, but in none of them was a radical cure produced.

The seventh and last communication, from Prof. Paul F. Eve, of Augusta, Ga., gives an interesting history of two operations, on a boy of ten years of age, for reducible inguinal hernia, supposed to be congenital. The first operation was that of Bonnet, by means of pins, which was unsuccessful, and, at the end of a month, "a portion of the scrotum was invaginated." After adhesion took place, one of Chase's trusses was applied. The patient continued well for eight months after the last operation, and the operator thinks that he has reason to believe that the cure will be permanent.

This, from the age of the patient, would be very likely to be the result of any method which should prevent, for a year or more, the descent of the hernia.

While the Committee would express their grateful acknowledgments to the individuals who have made the communications that have just been referred to, they at the same time do not feel that all the information has in this way been obtained that the Association have a right to expect. They have, therefore, looked to other sources in addition, to aid them in the preparation of their report; and they will now state, as briefly as they can, what has been done in relation to the radical cure of reducible hernia, and the opinions they have formed on the subject.

It is hardly necessary to go into a detailed history of the various methods that have been employed for the last eighteen hundred years for the permanent cure of reducible hernia. A very interesting and condensed account of them may be found in a dissertation, by Henry Bryant, M. D., of Boston, on "The Radical Cure of Inguinal Hernia," published during the present year, and for which the Boylston Prize was awarded to the author in the year 1847.

All the operations that have been practised for this purpose, till

within the last fifty years, have been of a severe character ; some of them dangerous, and in many instances death has been the consequence. *Cauterization, ligature, sutures, excision* of a *part* or the *whole* of the *sac*, and *castration* were the principal operative methods in use for eighteen hundred years. The object of all of them was to obliterate or contract the neck of the sac, and thus prevent the protrusion of any of the abdominal contents.

Cauterization.—The caustic was applied to the skin just over the external ring in inguinal hernia, and immediately below Poupart's ligament in femoral. Sometimes the actual and at others the potential cautery was used. It was not unusual to make several applications of the caustic, so as to destroy the skin, sac, and periosteum in inguinal hernia, and thus produce an exfoliation of the bone. When the eschar separated, the part was dressed in the same way as a common ulcer. This was the method adopted by the ancients in the performance of this barbarous operation. Monro, and some other practitioners of modern times, modified it by making an incision in the first instance, and exposing the neck of the sac and then applying the caustic. They thought that they thus increased the chance of success, and at the same time lessened the danger.

But even when modified in this way the most disastrous results often followed it. The spermatic cord was not unfrequently destroyed; the intestine was sometimes perforated; and in many cases death ensued, either from violent and extensive sloughing of the scrotum, attended with severe constitutional irritation, or from peritoneal inflammation. And, in addition to all this, in several instances in which the patient survived this severe treatment, the hernia re-appeared.

It is hardly necessary to add that no one at the present day could probably be found to justify, much less perform, such an operation. It is not, perhaps, surprising that the ancients, in their anxiety to relieve an infirmity which was so common, and over which, from their ignorance of anatomy, they had so little control, should resort to almost any method that held out a tolerable prospect of success; but it is wonderful that, after the repeated failures that followed it, as well as its often fatal results, it should have continued in use till modern times.

Ligature.—Ligatures were applied in different ways. One of the earliest methods was to pass a string around the integuments over

the neck of the sac, its contents having been previously returned into the abdomen, and tying it so tightly as to cause all the parts below to slough. In inguinal hernia in the male, this, of course, destroyed the testicle.

Another mode was to pass a needle with a ligature through the skin and around the neck of the sac, and then tie the ends of the ligature over a piece of wood placed on the integuments. The pressure could in this way be increased till sloughing was produced; and it was pretended by some who practised this operation that, if proper care was used, the sac only might be included in the ligature, and thus the testicle be saved. This, however, did not prove to be true; it was found that notwithstanding the utmost precaution, the spermatic cord was so much compressed that the functions of the testicle were lost, even if the organ itself was not destroyed.

In order to obviate this difficulty, the operation by the "punctum aureum," as it was called, a ligature of golden wire, was suggested and practised. An incision was made in the integuments, the sac laid bare, and a needle, armed with a wire of gold, was carried under the neck of the sac near the external ring. The ligature was tightened from time to time, and it was thought that the neck of the sac might in this way be sufficiently closed to prevent the return of the hernia, without destroying the spermatic cord. But such was not the fact.

The same operation was performed with a common ligature, and sometimes with one of lead. But in all these methods, so much pressure was made on the spermatic vessels as to produce an atrophy if not an entire destruction of the testicle; and this circumstance, probably, more than anything else, led to the operation by

Suture.—This method, because it did not destroy the virility of the patient, and would not consequently deprive him of the power of increasing the king's subjects, was called "the royal stitch."

There were two modes in which this operation was performed. The first step in both was to return the contents of the hernial sac. This being done, in one method a needle armed with a ligature was passed through the neck of the sac, which was sowed up by the continued suture, as is done in wounds of the intestines. No incision was made, but the needle was carried through the integuments.

In the other method, the hernial sac was first laid bare, the continued suture was used in the same way, and then a part or the whole of the sac below the suture was removed. In both cases the thread

was allowed to remain till it was thrown off by the process of ulceration.

This operation could only be used in inguinal hernia. It was by no means uniformly successful; it was difficult to perform, when the sac was to be dissected away; always severe and dangerous, and oftentimes followed by death. For these reasons it is not practised at all at the present day, but is reprobated by all modern surgeons who have had occasion to speak of it.

Excision.—Excision of a part or the whole of the hernial sac was another of the operations that was in practice till comparatively modern times, for the radical cure of reducible inguinal hernia. When the first method was adopted, the contents of the sac being previously returned, a portion of the covering of the hernial tumour, including the integuments and hernial sac, was cut away just below the external ring. The parts were then brought together and allowed to heal; and it was thought that such a contraction would be produced in the mouth of the sac as would prevent any farther protrusion. This, however, was rarely the case. The operation, too, was necessarily a severe one; fatal peritonitis frequently followed it, and in many cases death ensued from a wound of the viscera, which adhered, as they often do, to the neck of the sac.

The removal of the whole or the greater part of the sac was a still more severe and dangerous method, and at the same time equally uncertain. Probably because fatal hemorrhage was by no means an unfrequent consequence of this operation, a modification of it was practised, but with very little, if any more success. This consisted in making an incision from the neck to the bottom of the sac, and then removing a portion of it on each side, the whole length of the incision.

Another operation, that was practised to a great extent and for a long period, though not so dangerous, but far more unwarrantable than that of excision, was *castration*.

This was done occasionally with the knowledge of the patient, but more frequently without. Till within a very recent period, most persons afflicted with hernia, especially inguinal, have been anxious to conceal the fact, from the erroneous opinion that it impaired, if it did not destroy, their virility. They were willing, therefore, to submit to almost any severe method of treatment that would relieve them of their infirmity. But it is hardly to be supposed that they would consent to the removal of one of the genital organs, because they

apprehended a loss of its functions, any more than that they would commit suicide to escape death.

It is well known that various operations were performed for the radical cure of reducible hernia by ignorant persons, oftentimes unprincipled charlatans, who were not very scrupulous as to the means they adopted. Finding that their other methods failed very frequently, and in many instances caused death, they thought that castration would be more likely to produce a cure, and at the same time be far less dangerous. They pretended only to make a free incision in the sac, and declared that, when the wound was healed, the neck of the sac would be so much contracted that a permanent cure would be the consequence. That most of these operators had no confidence in this statement, is apparent from the fact that, after making the incision, they proceeded to divide the spermatic cord and remove the testicle; and such was the ignorance of many of them, that in numerous cases the patient died from the loss of blood. To such an extent was this barbarous operation carried at one time, that, in some parts of Europe, penal laws of the severest character were enacted to prevent it, and its performance for the cure of hernia was in some countries made a capital offence.

It was done oftentimes by uneducated, itinerant operators, some of whom not unfrequently were females, not only for the cure, but for the prevention also of hernia, and for this purpose thousands of children have been subjected to this mutilation.

The danger of the operation and its frequent want of success may perhaps be in some measure attributed to the unskilfulness of the operators; but it often failed of effecting a cure, and sometimes caused death, when practised by the most expert. Notwithstanding all this, and in defiance of the law, there were found individuals who continued to practise it for this purpose till within the last sixty years.

It is certainly remarkable that inguinal hernia should return so frequently as it is said to have done after castration; but we have the authority of Sabatier for saying that it was not more effectual in removing the difficulty than the application of caustic, the golden ligature, and some of the other methods that have been already noticed.

This fact should teach us not to place too much reliance on any of those operations that are intended to produce a partial or complete closure of the neck of the sac; for, when the testicle was extirpated for the cure of hernia, the whole sac was sometimes removed by

passing a ligature around it, just below the external ring, which caused the parts below to slough, and yet the hernia occasionally again protruded.

The severity, danger, and frequent failure of these operations at length caused all of them to be abandoned; and Mr. Lawrence said, with great justice, in his treatise on hernia, more than five-and-thirty years ago: "Since the enlarged state of the tendinous opening is not removed by the processes adopted for a radical cure; since a recurrence of the disorder is not prevented, we may assert without hesitation that these operations do not afford any greater chance of complete relief, than the employment of a truss."

The Committee will next inquire whether any of the numerous methods that have from time to time, since that period, been suggested and put in practice, have been attended with a greater degree of success. They will not go into a minute detail of all of them, but will present such a general view as will, they trust, make apparent the ground on which their opinions rest.

It should be remarked that none of the modern operations for the radical cure of hernia are as severe as the worst of the older ones of which we have already spoken; though some of them, it must be admitted, are very objectionable on this account.

It should also be observed that the mere fact that so many have been suggested and tried, and that none of them have been received with a great degree of favour, or, if so, that they have not retained it for any considerable length of time, is strong presumptive evidence that there is either an inherent difficulty in the nature of the infirmity that is intended to be removed by them, or that the means of accomplishing it have not yet been discovered.

It is well known that most of these operations have been devised for the radical cure of inguinal hernia, as this is the most frequent form, and the one which is, on the whole, productive of the greatest inconvenience. The object has been to close either wholly or in part the neck of the sac, or plug up, without contracting, the tendinous openings through which the hernia escapes. It has been attempted to accomplish both these in various ways.

In some operations that have been performed for omental hernia, whether strangulated or merely irreducible, a portion of the omentum has sometimes been left in the inguinal canal, under the belief that the adhesions which it would form with the surrounding parts would prevent any future protrusion. Several surgeons have reported cases as successfully treated in this way; but it is not stated

for how long a time the patients enjoyed this immunity, and it cannot therefore be known whether the cure was permanent.

One of the Committee is able to state a case which came under his own observation, which, in his opinion, has an important bearing on this point. A healthy young man underwent an operation for irreducible omental hernia. All the omentum beyond the external ring was cut off; the inguinal canal was plugged up by the omentum, which was closely adherent to it; and it was remarked at the time that the patient would never probably be troubled with hernia again. Within two years of that period, he was obliged to submit to an operation for strangulated enterocele on the same side. The very circumstance that was supposed to be sufficient to relieve him permanently was probably the cause why the hernia could not be returned by taxis.

It has been attempted to close the external ring by forcing the testicle into it, and then bringing on such a degree of inflammation as would be likely to retain it there by the effusion of fibrin. Sometimes this has been done without making an incision in the integuments, and at others the testicle has previously been laid bare.

This operation is certainly not admissible. It is unsafe; it is not probable that the testicle could be kept either at the external ring or within the inguinal canal; if it could, it would, no doubt, be a source of great inconvenience and irritation, and in addition to all this, it would not in all probability prevent the return of the hernia, but would, on the contrary, rather facilitate it.

It has been attempted also to close the external ring and inguinal canal by means of the hernial sac. This operation has been done by Petit and Garengot. The sac is first exposed; a portion of it is then crowded into the inguinal canal, under the expectation that adhesions would be formed between them sufficiently strong to prevent any subsequent descent of the hernia. This method is, perhaps, less objectionable than the preceding one, on the score of danger to the patient, though by no means entirely free from it, but is not any more likely to effect a cure. There is no reason to believe that it is performed by any one at the present day.

M. Gerdy has practised an operation, which consists in crowding the integuments into the inguinal canal, and removing the cuticle from them by means of caustic alkali. This is what has been called by the French "invagination by the integuments." Some modifications of this method have been suggested by M. Leroy and M.

Signorini, but from what we have been able to learn, we do not deem it of sufficient importance to give any detailed account of it.

M. Velpeau states that he performed it once unsuccessfully; that it had been done by M. Gerdy upon thirty patients; and that, though many of them seemed for a time to have been cured, a sufficiently long period had not elapsed to enable any one to speak with confidence of the ultimate result. He also adds that he had seen three of the persons who had been thus operated on, and who thought for some time after the operation that they were cured, in all of whom the trouble had returned precisely as it was before.

The truth seems to be that the adhesions which may be formed between the integuments and the interior of the canal are not very firm, and that, though they may for a time prevent the descent of the hernia, yet, as they are gradually absorbed, no resistance is at length offered to it.

Mr. Velpeau observes that, though it is not actually a dangerous operation, there is some risk of wounding the epigastric artery, and there is some reason, too, to fear severe phlegmonous inflammation or fatal peritonitis.

M. Belma's operation attracted for a time some degree of attention, as it was less severe than that of M. Gerdy, and would, it was at first thought, be in all probability more successful. His first method consisted in introducing a small pouch of goldbeater's-skin into the upper part of the hernial sac. This was followed by an effusion of fibrine, which he supposed would, together with the goldbeater's-skin, become organized, and the two sides of the sac being firmly glued together must necessarily prevent any subsequent protrusion of the abdominal contents.

He afterwards modified his operation, because he found that his success did not equal his expectations. This he attributed to a deficiency of inflammation; and with a view of increasing this, he introduced into the neck of the sac, as near the external ring as possible, small rolls of gelatine covered with goldbeater's-skin. There is no reason to believe that the result of this proceeding was any more favourable than that of the other. The operation has fallen into disuse. M. Velpeau says that the hernia returned more frequently after it than it did after that of M. Gerdy.

Dr. Jameson, of Baltimore, has given a description of an autoplasmic operation which he performed on a female for crural hernia. The Committee have not seen the original account of the case, but have

derived their knowledge of it from the statements that have been made in the works of others.

The sac was laid open, and the crural ring was filled up by a portion of the integuments, which were cut into a proper form and inverted. This was confined in its situation by sutures. Adhesion is said to have taken place, and the patient was regarded as cured.

Admitting that there was no danger in the operation, it is certainly not probable that any union would take place between the integuments and the ring that would be permanent; on the contrary, it can hardly be doubted that the fibrine effused in the first instance would be gradually absorbed, and that a protrusion of some of the abdominal contents would ere long again take place.

It is believed that this operation has not been repeated; or, if it has, the result, so far as we know, has not been made public. This fact would perhaps justify the inference that the relief obtained by the patient on whom Dr. Jameson operated was not permanent; otherwise, it would be difficult to explain why a similar operation should not have been adopted in other instances.

M. Graefe has described a very barbarous mode he took to bring on inflammation in the inguinal canal, with a view to the radical cure of hernia. It has no advantage over the old and justly reprobated operation of the excision of the sac, while it is almost as severe, and far more dangerous. It consists in laying bare the neck of the sac at the external ring, cutting it off at that place, and then introducing a piece of lint, smeared with some stimulating ointment, into the inguinal canal, carrying it up to the internal ring, or even beyond. One end of a piece of string is to be tied around the lint, and the other end is brought out at the wound. When suppuration is well established, the lint becomes loose and can be readily withdrawn. This is said to take place usually in three or four days, and the amount of inflammation that is induced would be sufficient, it was thought, to prevent any future descent of the hernia.

This operation has been performed, it is said, with success in a few cases; a result certainly not to be looked for, and the expectation of which would not justify any man, who had a proper regard for human life and his own reputation, to repeat it.

The introduction of a seton has been recommended as a likely means of closing the neck of the sac. It has been advised to keep it in till suppuration comes on, and then withdraw a part of the threads daily, till all of them are removed. It was supposed that

in this way adhesion might be produced between the opposite sides of the sac.

It is not probable, from what we know of its effects in hydrocele, that this would succeed; and it is much more probable that it would bring on such a degree of inflammation in the peritoneum as would terminate in death. From what is known of the laws of inflammation, there is much more reason to suppose that the suppurative process rather than the adhesive would be induced by this long-continued irritation; so that, while the patient would be exposed to great hazard, he would have but a small chance of a cure.

M. Bonnet, an eminent surgeon of Lyons, has attempted to close the neck of the sac by exciting inflammation in another way. From two to four pins, with double the number of small pieces of cork, are all the instruments that are required for his operation. The contents of the hernial sac having been returned, a pin which has been passed through one of the pieces of cork is then pushed through the integuments and the neck of the sac, as near as possible to the external ring, care being taken not to wound the spermatic cord. The pin is then brought out on the opposite side, and the point is carried through another piece of cork. Another pin is then introduced in the same way. Two are usually all that are necessary; but occasionally one or more additional ones may be required. The point of the pin which projects from the cork is seized with a small pair of pliers, and bent over so as to bring the opposite sides of the sac into close contact. This is done to all the pins, and this process is repeated from day to day, till it is thought a sufficient degree of inflammation is produced to cause adhesion. When this has taken place, the pins should be removed, and this is usually in from six to twelve days.

M. Mayor, of Lausanne, has modified this operation by using needles instead of pins, carrying in this way ligatures through the neck of the sac, which are afterwards tied over pieces of sponge. These can be tightened as much and as often as may be thought necessary to produce the desired effect. The number of ligatures required for this purpose must depend on the size of the hernial sac.

These operations are not attended with much danger, and are by no means difficult to perform. At the same time they offer but little prospect of a successful result. They are insufficient for the purpose for which they are intended. They do not obstruct in any degree

the inguinal canal, and even when most successful, they only partially close the neck of the sac.

For these reasons, probably, if not for others, they have fallen entirely into disuse, not being resorted to even by the inventors of them.

Acupuncture has been tried to a very considerable extent both in Europe and this country. Two or three rows of punctures were made through the integuments and the neck of the sac, just below the external ring, with a common needle of the ordinary size, or an acupuncture needle prepared for the purpose. There is no reason to believe that any permanent good effect has been produced in this way, and it is not probable that any one tries this method at the present time with the expectation of producing by it a radical cure of hernia.

The same may no doubt be said of the *scarification of the inguinal canal*, as practised by M. Velpeau a few times, and the *subcutaneous scarification of the neck of the sac*, as performed by M. Guerin. Besides the utter inefficiency of these operations, there is, especially in the former, some danger of wounding the epigastric artery.

The operation by *injection* has been done in two ways. In one, the neck of the hernial sac is previously laid open, and the fluid then thrown in; and, in the other, it is introduced by the subcutaneous method. The first is the operation as performed by M. Velpeau, and the other that of Dr. Pancoast, of Philadelphia.

M. Velpeau was evidently dissatisfied with all the operations that had been performed for the radical cure of reducible inguinal hernia; but he was unwilling to believe that no remedy could be found for it. The success which so often followed the operation for hydrocele by injection, led him to think that a similar course might produce the same results in the treatment of reducible hernia.

He accordingly performed the operation on the first favourable case that presented. An incision of an inch in length was made just below the external ring down to the neck of the sac; this was opened with a bistoury, and a mixture of six drachms of tincture of iodine in three ounces of water was thrown in. An assistant compressed the inguinal canal, so as to prevent the fluid from coming in contact with the peritoneum above the ring. After the injection had been pushed around the various parts of the sac, it was allowed to escape through the canula. No unpleasant symptoms followed; but the final result of the experiment has not, as far as we know, been made public.

M. Velpeau does not seem to have much confidence in the operation, and it is understood that he does not continue to perform it at the present day. He has probably learned that something more than the mere closure by the process of adhesion of the neck of the sac is necessary for the radical cure of hernia. The fibrine that is effused will in most cases be soon absorbed, so that the barrier which had been relied on to prevent the descent of the hernia will be entirely removed.

About the same time, Dr. Pancoast performed the operation, which is described in his work on "Operative Surgery." The hernial sac, its contents having been previously returned, was punctured with a small trocar passed through a canula. Having ascertained that the instrument was fairly in the sac, by the freedom with which it could be moved about, the point of it was then directed upwards so as to scarify the internal surface of the upper part of the sac. The trocar was then withdrawn, and half a drachm of the tincture of iodine, or an equal quantity of the tincture of cantharides, was thrown in slowly by means of a small syringe fitted to the canula. The canula was then withdrawn, and a compress was applied just above the external ring, and the pad of the truss, which had been put on before the operation, was brought down over the compress.

This operation was performed in thirteen cases, in one of which only were there any symptoms of serious inflammation, and these readily yielded to leeches and fomentations. On some of these patients a single operation was performed, and on others, in whom the sac was large, several were required. All of them were evidently benefited at the time, but whether a radical cure was effected in any instance could not be ascertained, as nothing was known of the patients after a few months from the time of the operation. Whether Dr. Pancoast continues to practise it, we are unable to say.

This method has, in the opinion of the Committee, all the advantages of that of M. Velpeau, while it avoids in a great degree the danger of peritoneal inflammation, to which patients are exposed by his mode. When the hernial sac is laid open, there is of course a direct communication between the abdominal cavity and the external wound. This alone would be likely to excite inflammation, and if, in addition, a part of the peritoneum is subjected to the action of an irritating fluid, there is reason to fear that the inflammatory process would not be limited to the sac, but that fatal peritonitis would be the consequence.

Admitting that these operations accomplished all that they were

designed to do, it does not follow, by any means, that they would in every instance produce a radical cure. All that they could effect, if successful, would be to close the neck of the sac, without contracting the tendinous opening or ring. Sir Astley Cooper very truly says "that, although the original sac may be completely shut at its mouth by adhesion or perfect contraction, it is possible that another sac may be formed contiguous to the first." In fact, it is well known that sometimes the hernia has recurred, after the whole of the original sac has been removed. Contracting or even closing the neck of the sac is evidently then not enough; "something more," says Mr. Lawrence, "is required; we want a remedy that should contract the tendinous opening; for while that remains preternaturally large, a new protrusion is a highly probable occurrence."

This has been attempted in two ways. The first is by scarification of the external ring in inguinal hernia, and the other is by means of sutures. The first of these is quite an old operation. Heister says that "some surgeons scarify the ring of the abdomen, or aperture through which the intestine prolapsed, together with the skin, in order to render the cicatrix more firm; by which means many have been cured of these ruptures, especially if they continue to wear a proper bandage for a considerable time afterwards. But I think that the operation may succeed better in infants than in adults."

It is perhaps enough to say, with regard to this method, that it has been occasionally tried from time to time, for more than a hundred years, without a sufficient degree of success to gain the confidence of surgeons; and it is not to be overlooked that the danger of wounding the epigastric artery is no inconsiderable one; enough at any rate to deter all but the most expert from attempting to perform it.

The operation of closing the external ring by means of sutures is, we believe, quite a recent one. It is proposed by Thomas Wood, M. D., of Cincinnati, who states that he has performed it in three cases with success. His paper on the subject may be found in the last volume of the *Transactions* of this Association. It is certainly entitled to great consideration, not only from the importance of the subject, but from the candid manner in which he has treated it.

He says that his "experience is too limited to warrant him in saying much in its favour, but he cannot refrain from expressing the opinion that it offers to the ruptured patient a better prospect of a 'radical cure' than any operation before proposed."

He thinks that all the preceding operations have failed, because, from the nature of the texture concerned in them, the adhesions have not been sufficiently strong to prevent the descent of the hernia, and he founds his expectations of success from his method on the following considerations: "Tendons," he says, "when wounded, will unite again by a formation similar to their original structure."

"Tendon is a permanent, unyielding tissue, seldom ruptured by the strongest exertions of the body."

"If we can close the external ring by a tendinous growth, we may effect a 'radical cure of hernia.'"

We do not deem it necessary to go into the details of the operation; for these, we refer to the author's paper. But we would remark that it is by no means certain that tendons, when wounded, are united by a similar substance. Much light has been thrown on this point within the last few years by the numerous cases in which tenotomy has been performed, and the Committee think that they are justified in saying, that it has been ascertained that the divided edges of tendons are united by a substance less resisting, more elastic, and not so firm as the original texture of the tendon.

But, although this operation may not be found on further trial to be more successful than that of the scarification of the ring, yet, as it proposes to accomplish what has never been effected in any other way, viz., the contraction of the tendinous opening, it certainly, on this account, if no other, merits the careful consideration of the profession.

An operation similar to that of Dr. Pancoast, if not precisely the same, has been performed to a considerable extent in the neighbourhood in which your Committee reside. Many persons, it is said, have been cured by it; but we have not met with any one of them who has felt that the truss could be safely laid aside. In one instance which has come to our knowledge, an individual submitted to the operation and thought himself cured. In a few months after, he gave up his truss, supposing that compression was no longer required, but in eighteen months from that time the hernia returned.

It is not pretended, however, that a cure may never be effected by this method, when all the circumstances of the case are favourable. It may happen, sometimes, when the hernia is small and recent, and when the patient is in good health and young, or has not passed the middle age of life; and it may too be of great advantage in some cases in which the hernia could not be kept up by the truss alone, as

this operation would be likely to cause an abundant effusion of fibrine in and about the neck of the sac.

Two of your Committee have had some personal knowledge of it; the results of their observation and experience will be found at the end of this report.

It is an unquestioned fact that reducible hernia is often cured in young subjects. It may be accomplished in them by various means; but it should not be thence inferred that the same course would uniformly produce like effects in adults.

It may be remarked that, in children, any method which can prevent the protrusion of the hernia for a year or more will, in all probability, produce a permanent cure. If the aperture through which the contents of the sac must pass can in any way be prevented from enlarging, while the viscera of the abdomen are increasing in size, it is obvious that a great length of time would not be required to render an escape of any of the abdominal organs difficult, if not altogether impracticable. We see familiar examples of this daily in umbilical hernia, which is brought on so often in infancy by hooping-cough and various other causes. *Compression*, it is well known, will, in all such cases, if carefully practised, in a comparatively short period produce a radical cure; and it is a valuable agent in the management of reducible hernia at every period of life. It has been used from the time of Celsus to the present, and it has not unfrequently succeeded in producing the desired result. It is usually applied at the present day by means of trusses. Great improvement has of late years been made in their construction. It cannot be doubted that an instrument of this kind, when nicely adjusted, so as to cause no pain or inconvenience, and at the same time to compress the neck of the sac, may, if used for a considerable length of time, prevent in many cases the subsequent protrusion of the hernia.

It is well known that pressure upon a serous membrane, when carried to a certain extent, will cause an effusion of fibrin on its inner surface, and it was from a knowledge of this fact that, in former times, the method of treating aneurism by compression was adopted. This mode often succeeded in producing a radical cure, by closing the artery leading to the aneurismal sac. The practice has been revived with great confidence within the last few years, and the results hitherto have been equal to the expectations of its advocates.

In the treatment of hernia in this way, it is of the utmost importance that protrusion should not be allowed to take place at any time;

“for if the hernia once descends during the wearing of the truss,” as Sir Astley Cooper well remarks, “the cure must be considered as recommencing from that moment.” The truss, therefore, should be worn by night as well as by day.

It is important, also, that while the pressure is sufficient to prevent the descent of any of the abdominal contents, it should not be enough to cause any considerable degree of inflammation. This would not only require the truss to be laid aside altogether, but it would also stop entirely the effusion of fibrine. In inguinal hernia, the pad should be so placed as to compress the inguinal canal; and at the same time great care should be taken to avoid pressing the spermatic cord against the pubis.

A radical cure will not be effected in this way, unless the compression is continued for a length of time. It cannot be reasonably looked for in an adult in less than two years from the time the truss is first worn; and it can hardly be expected at all in persons after the middle age of life, who are afflicted with a direct inguinal hernia of long standing. At the same time, more benefit is derived from compression in such cases than from anything else, and persons in this situation are not safe without it.

The Committee beg leave to offer the following opinions as the result at which they have arrived after a careful examination of the subject committed to them.

I. That there is no surgical operation at present known which can be relied on with confidence, to produce in all instances, or even in a large proportion of cases, a radical cure of reducible hernia.

II. That they regard the operation of injection by the subcutaneous method as the safest and best. This will probably in some cases produce a permanent cure, and in many others will afford great relief.

III. That compression, when properly employed, is, in the present state of our knowledge, the most likely means of effecting a radical cure in the greatest number of cases.

All of which is respectfully submitted, by

GEO. HAYWARD,	} Committee.
J. MASON WARREN,	
S. PARKMAN,	

APPENDIX

TO THE

REPORT ON THE PERMANENT CURE OF REDUCIBLE HERNIA.

(No. 1.)

STATEMENT OF J. MASON WARREN, M. D.

IN October, 1847, some operations were performed by me, at the Massachusetts General Hospital, for the radical cure of hernia. They were, I believe, the first done at that institution with this object, and have since been repeated there by myself and others.

The method proposed by Dr. Pancoast some years since, modified a little according to circumstances, was pursued in most of the cases. It may be described as follows:—

The contents of the hernial sac being returned into the abdomen, and the ring explored to ascertain that no portion of the intestine protrudes, the pad of a well-fitting truss is slipped down so as to make pressure on the inguinal canal, and prevent any escape of the hernia. With the forefinger of the left hand, the spermatic cord, as it passes out from the external inguinal opening, is pressed upwards on the pelvic bone, so as to prevent it from being injured. A delicate trocar and canula, the latter having fitted to it a small Anel's syringe, is now carefully but firmly forced through the integuments with a rotatory motion to facilitate its progress, and pushed forwards till it enters the external inguinal ring or neck of the sac. The trocar being now withdrawn, the canula is kept firmly in place, and twenty or thirty drops of the tincture of iodine, tincture of cantharides, or sulphuric ether, thrown in and lodged in the neck of the sac, when this is practicable, or else in the vicinity of the external abdominal ring. Subsequently to the operation, a small compress is applied over the minute wound made by the trocar, the pad of the truss slipped down over it, and the patient directed, for a week or two, to maintain the recumbent position.

In addition to the injection, in some of the operations, a tenotomy knife was previously introduced, and the internal surface of the neck of the sac scarified. The wound made by the knife, in these cases, much facilitated the subsequent introduction of the trocar, which is with some difficulty worked through the integuments.

In no instance did any bad result follow the operation—the pain

and inconvenience hardly amounting to that presented in a case of hydrocele treated by injection or in any simple operation.

The following case, attended with success, will serve as an illustration of the course generally pursued:—

A male child, three years of age, with congenital inguinal hernia of the right side, was brought to the Massachusetts General Hospital to obtain relief, if it was possible, as no truss had been found to retain the protruded intestine in the abdomen, and the pain and inconvenience from the infirmity were great. On examination, a tumour, the size of a small orange, was found to occupy the scrotum. By a little manipulation, the contents were ascertained to be a portion of omentum, a loop of intestine, and the testicle—the whole of which, by care, could be easily returned into the abdomen.

The question which first presented itself was, whether the testicle could be separated from the other parts, the adhesions being quite intimate between them, so as to admit the return of the intestine and omentum into the abdomen, leaving the testicle in the scrotum. This being determined, the operation was performed as follows: The intestine and omentum being returned into the abdomen, and the testicle prevented from following, the spermatic cord was held out of the way in the manner stated above. A subcutaneous incision was then made by a cataract knife, the point of which was carried into the sac, and the neck scarified in different directions. Through the aperture thus made, a small trocar and canula were introduced; the former being withdrawn, the syringe was adapted, and thirty drops of sulphuric ether were injected. The truss was now applied.

The operation was performed on October 28, 1847, and there was every prospect of success, when, from a violent paroxysm of crying, the hernia was forced down on December 9. On the 12th, the injection was repeated, and resulted, on the following day, in a swelling of the scrotum, such as is observed after the injection for hydrocele. On December 22, the report was made that the hernia came slightly down, and was returned with difficulty, “the aperture being apparently quite small.” By the end of the month, it was stated that the hernia was perfectly retained.

I have been informed by an individual who saw this patient a year afterwards, that the cure was permanent.

During the treatment of this case, a slight superficial suppuration took place under the pad of the truss, which, the patient being somewhat fractious, was necessarily applied pretty firmly to prevent the recurrence of the hernia after the operation.

In a large proportion of the other cases operated on, the patient experienced much relief, though still obliged to wear a truss. In one case, where the hernia was quite large, no relief was experienced. A female, with a double femoral hernia, on whom the scarification and injection were once or twice repeated, expressed herself much benefited by the operation, the hernia being retained, and the suffering previously experienced much relieved. Another patient, a labouring man, was seen by me six months after the operation; the rupture

had not recurred, but he still wore a truss. Previous to this time, he had been unable to work without forcing down the intestine under the pad, causing so much pain and ill health as to have induced him to come to Boston for relief.

Some allowance for the want of perfect success in the above operations must, of course, be made from the tentative mode in which they were performed through fear of a serious result.

From a comparatively limited experience, I derive the following conclusions:—

1. That the operation, when carefully performed, is safe.
2. That, in ruptures where the neck of the sac is small and the abdominal aperture not too much enlarged by repeated descents of the hernia, there is a prospect of a radical cure.
3. That, in most cases, the operation mitigates the infirmity, allowing the hernia to be more readily retained by the ordinary mechanical means.

J. MASON WARREN.

Boston, *April*, 1852.

(No. 2.)

STATEMENT OF SAMUEL PARKMAN, M. D.

I have operated, at the Massachusetts General Hospital, in four cases for the permanent cure of hernia.

The first case was in January, 1848; the second and third in September, 1849; and the fourth in October, 1851. The herniæ were all inguinal. The method employed was scarification of the pillars of the ring and adjacent parts, with injection of tincture of iodine, by means of a syringe armed with a point at the nozzle. The precise situation where the fluid was thrown I believe it to be impossible to determine. It is clearly more probable that it should have been into the cellular tissue around the neck of the sac, than into the sac itself. In all the cases, I compressed the canal to prevent communication with the peritoneal cavity. Rest in the horizontal position was enjoined, and a bandage applied. Some tenderness and swelling resulted in all the cases.

The first patient considered himself relieved, that is, he felt that the hernia descended with more difficulty.

The second and third cases presented no marked results.

The fourth case is worthy of note.

A healthy man, twenty-five years of age, stated that the right testicle did not descend until his tenth year, and was then followed by a hernia. This hernia had always been reducible, but the testicle was returned with it. A truss had but imperfectly retained the hernia, and he was desirous of relief if possible. On examination, the ring appeared very large, and coughing or straining produced the descent of a mass the size of a goose-egg, on the front of which

was the testicle, which could not be separated from the hernia proper. I proposed to retain the whole mass, and with this view, between the 29th October and 10th November, I did four separate operations, each time scarifying the pillars of the ring and injecting tincture of iodine. Each operation was followed by an effusion into the parts, and on November 14, when the patient was discharged by his own request, he stated that he had a feeling of firmness in the ring which he had not previously. I have no doubt, however, that the hernia could readily have been made to descend.

The conclusion from this small experience appears to me to be :—

That the operation by scarification and injection, being perfectly safe, is worthy of being practised to test the amount of its efficacy—but the fact that so many other methods, which, *à priori*, would seem more calculated to produce the same expected result, viz., the plugging the neck of the sac or ring with lymph, have not cured the disease, should suggest very great caution in the formation of an affirmative opinion from any but a large and long experience.

The operation, as practised by Dr. Wood, of Cincinnati, also in my opinion offers many inducements to surgeons, to make it the subject of experiment. Since proposing, as it does, the *approximation* as well as agglutination of the pillars of the ring, it attempts to meet the objection that may be made against all the other methods, viz., that the tendinous opening remaining the same, but an imperfect barrier can be opposed to the redescend of the hernia.

S. PARKMAN.

Boston, April 9, 1852.

(No. 3.)

LETTER FROM HENRY J. BIGELOW, M. D.,

Professor of Surgery in the Medical School of Harvard College.

Boston, April 15, 1852.

DR. HAYWARD AND GENTLEMEN OF THE COMMITTEE—

Gentlemen: I have the honour to acknowledge the receipt of your circular respecting the radical cure of hernia. In reply, I would make the following statements of the result to which I was led by some investigation of the subject a few years since.

1. I know no method which affords much more than a chance of radically curing this affection.

2. There is a chance of curing hernia, and also a chance of permanently relieving it, by treatment other than the application of a common truss.

3. There is, on the other hand, a considerable chance that the patient will receive no benefit whatever from such treatment.

4. Some of the proposed methods of treatment are hazardous to the patient, and therefore inadmissible. But on the other hand some are comparatively innocuous; such as that by the hard truss; and also an operation which has attracted some notice in the neighborhood

within a few years, viz.: that by scarification and stimulating injection, practised by Velpeau, and subcutaneously by Pancoast.

5. If a patient desires to undergo such a comparatively slight operation, for some chance of subsequent improvement, and for a small additional chance of permanent cure, he may be gratified by an operation of this last description. By improvement, is here meant such, for example, as an acquired ability to ride on horseback; or a greater facility in retaining the hernia with a truss. There is little probability that the patient will dispense with his truss; and the hernial contents, if confined to the abdomen for a time, will be likely to escape again in the course of weeks or months.

6. It is well known that a small or recent hernia, or one occurring in the young subject, is occasionally cured by a truss or by a horizontal posture; the abdominal contents being retained, while the tendinous aperture grows spontaneously smaller. But such spontaneous contraction of the ring does not often take place, and surgeons have devised many ways of plugging the ring with skin and other materials, by means of plastic lymph. This adhesive lymph has been the great agent relied upon to effect the cure.

7. The method by subcutaneous injection and scarification is probably the readiest and most harmless way of producing an effusion of this lymph in or about the neck of the sac. But lymph is essentially plastic, and yields to continued force. A wound of the abdominal parietes, thus united, is followed by hernia in the cicatrix; and a natural interval in the parietes plugged by lymph must have the same tendencies. Many patients have received no ultimate benefit from this operation. It may be also a question, how far a partial obliteration of the tendinous ring of a hernia may increase the liability to strangulation.

8. On the other hand, the contents of certain hernial sacs can be unquestionably thus glued *for a time* into the abdomen, and hindered from descending; and there are patients who, though they still wear a truss, believe their condition to have been ameliorated by an operation of this sort.

9. Having my attention called to the subject some years since, I have operated in a number of cases with various success; subcutaneously injecting the neighborhood of the neck of the sac with tincture of iodine, taking care also to disturb and to lacerate the tissues with the point of the instrument, for the purpose of promoting the effusion of lymph. For details connected with one or more of these cases; for a description of the operation, nearly identical with that practised by Pancoast; and for some brief remarks upon its merits, and its contingent accidents, I take the liberty to refer the Committee to a clinical lecture delivered before the class of the Mass. Med. College, and printed in the *Boston Med. and Surg. Journal* in Nov. 1850.

I have the honour to be, gentlemen, with great respect,

Your obt. servant,
HENRY J. BIGELOW.

This letter was not received until after the report was finished.

